

Serial No. 10/797,081

Attorney Docket No. 01-592-RCE

REMARKS

Claims 1 - 17 are pending. Claims 7 and 8 have been withdrawn. Claims 14 and 15 have been canceled without prejudice or disclaimer. The applicants respectfully request reconsideration and allowance of this application in view of the above amendments and the following remarks.

The Examiner has objected to the drawings for not showing the limitations of claims 14 and 15. Claims 14 and 15 have been canceled without prejudice or disclaimer. Therefore, this objection should be withdrawn.

Claims 4, 9 - 11, 14 and 15 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The applicants respectfully request that this rejection be withdrawn for the following reasons.

The examiner has asserted that the recitation of "a wire interval" in claims 4 and 9 is indefinite because only one wire has been defined in the claims. The applicants have accordingly amended claims 4 and 9 to recite "a plurality of wires."

Claims 14 and 15 have been canceled without prejudice or disclaimer.

Therefore, because claims 4 and 9 - 11, as amended, recite definite subject matter, it is respectfully requested that the rejection of claims 4 and 9 - 11 under 35 U.S.C. 112, second paragraph be withdrawn.

Claims 1 - 3, 5, 6 and 9 - 13 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. Publication No. 2002/0020879 to Shiiki *et al.* (hereafter: "Shiiki") in view of U.S. Patent Publication No. 2001/0053559 to Nagao. The applicants respectfully request that this rejection be withdrawn for the following reasons.

Serial No. 10/797,081

Attorney Docket No. 01-592-RCE

Claims 1, 6 and 9 and 12 have been amended to recite the novel embodiment disclosed, for example, on pg. 10, lines 10 - 18 in which the semiconductor device includes an interlayer insulating film above an area where at least one of an element and a wire is formed on a semiconductor substrate, and the interlayer insulating film includes an inorganic spin-on-glass film 20 and a tetraethylorthosilicate (TEOS) film 21 covering a surface of the inorganic spin-on-glass (SOG) film 20. The TEOS film achieves the superior effect of preventing water from penetrating the highly hygroscopic inorganic SOG film and contacting the thin film resistance element. Further, since the TEOS film is more resistive to high temperatures than a resin and can be made by chemical vapor deposition (CVD), the inorganic SOG film can be subjected to a high temperature process so that a more uniform surface can be formed.

Shiiki discloses a substrate in which a resistor 2 is formed over interlayer insulating film 3, which is above an area where a wiring 7 is formed on a semiconductor substrate. However, Shiiki fails to teach or suggest that the interlayer insulating film 3 includes inorganic SOG film and TEOS film covering the inorganic SOG film. The examiner has cited Nagao in order to cure the deficient teachings of Shiiki.

Nagao discloses a matrix substrate in which a pixel electrode 111 is formed over first and second leveling films 109, 110, which is above an area where a wiring 107 is formed on a semiconductor substrate 100. Nagao discloses that the first or second leveling films 109, 110 can include an inorganic SOG material. The examiner has asserted that it would have been obvious to one of ordinary skill in the art to have modified Shiiki to use the inorganic SOG material of Nagao for the purpose of using an insulating material that can function as a good leveling film.

Serial No. 10/797,081

Attorney Docket No. 01-592-RCE

However, Nagao fails to teach or suggest a TEOS film covering a surface of the first or second leveling films 109, 110. Rather, Nagao discloses that the pixel electrode 111 is formed on the second leveling film 110.

Further, applicants still question why one skilled in the art would be motivated to modify Shiiki in view of Nagao because Nagao discloses use of two leveling films to achieve a flat surface while Shiiki already discloses achieving a flat surface by CMP. The examiner has asserted that the motivation would be to eliminate CMP, which is both expensive and complex. However, an additional step would still be required, that is the additional leveling film as taught by Nagao. Therefore, there would be no saving in time or materials by using the leveling films of Nagao rather than CMP of Shiiki. The examiner has pointed to no suggestion in the references stating that use of two leveling films is advantageous to use of CMP. There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. (See In re Vaack, 947 F.2d 488 (Fed. Cir. 1991), cited in MPEP 2142, 8th Ed., Rev. 1, Feb. 2003).

Therefore, because Shiiki and Nagao fail to teach or suggest that the interlayer insulating film includes inorganic SOG film and TEOS film covering the inorganic SOG film, and further because one skilled in the art would not be motivated to modify Shiiki in view of Nagao, it is respectfully requested that the rejection of claims 1, 6 and 9 and 12 under 35 U.S.C. 103(a) be withdrawn.

Claims 2 - 3, 5, 10 and 13 depend from claims 1, 6, 9 and 12. Therefore, the rejection of these claims should be withdrawn for at least the above-mentioned reasons with respect to claims 1, 6, 9 and 12.

Serial No. 10/797,081

Attorney Docket No. 01-592-RCE

Claim 3 has been amended to be in independent form including the limitations discussed above in amended claim 1, and to further recite the novel embodiment disclosed, for example, on pgs. 19 – 20, and shown in, for example, Fig. 6, in which the interlayer insulating film comprises an inorganic spin-on-glass film, and wherein an upper surface of the interlayer insulating film has a higher area adjacent to an area where the plurality of thin film resistance elements is formed than in the area where the plurality of thin film resistance elements is not formed.

As discussed above, Shiiki and Nagao fail to teach or suggest that the interlayer insulating film includes inorganic SOG film and TEOS film covering the inorganic SOG film, and one skilled in the art would not be motivated to modify Shiiki in view of Nagao.

Further, Shiiki fails to teach or suggest that an upper surface of the interlayer insulating film 3 has a higher area adjacent to an area where the thin film resistance element 2 is formed than in the area where the thin film resistance element 2 is not formed. Rather, Shiiki discloses that the interlayer insulating film 3 has a leveled surface. (See [0045]). Therefore, the applicants respectfully disagree with the examiner's statement that "since the step in the insulating film is formed as a result of the underlying wiring 6, and that wiring is located under the resistance element, it follows that an upper surface of the interlayer insulating film has a higher area adjacent to an area where the thin film resistance element is formed than an areas where the resistance element is not formed," as the examiner's statement contradicts the explicit disclosure of Shiiki.

Therefore, because Shiiki fails to teach or suggest that the interlayer insulating film includes inorganic SOG film and TEOS film covering the inorganic SOG film, or that an upper surface of the interlayer insulating film has a higher area adjacent to an area where the thin film resistance element is formed than in the area where the thin film resistance element is not formed,

Serial No. 10/797,081

Attorney Docket No. 01-592-RCE

and because one skilled in the art would not be motivated to modify Shiiki in view of Nagao, it is respectfully requested that the rejection of claim 3 under 35 U.S.C. 103(a) be withdrawn.

Claims 16 and 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiki in view of Nagao. Claims 16 and 17 depend from claims 1 and 6. Therefore, the rejection of these claims should be withdrawn for at least the above-mentioned reasons with respect to claims 1 and 6.

In view of the foregoing, the applicants submit that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the examiner is invited to contact the undersigned by telephone.

If there are any problems with the payment of fees, please charge any underpayments and credit any overpayments to Deposit Account No. 50-1147.

Respectfully submitted,



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